WHAT IS CLAIMED IS:

1. A data recording apparatus comprising:

a recording/erase unit configured to record or erase target data by irradiating a DVD-RW medium with light beams with different intensities to change a phase change recording layer of the medium to a first data recorded state, second data recorded state, and data non-recorded state; and

an additional recording control unit configured to control additional recording of target data in response to an additional recording instruction by recording the target data by changing the phase change recording layer to the first and second data recorded states and by changing the phase change recording layer to the data non-recorded state from a recording terminal end of the target data over a predetermined length using the light beams with different intensities emitted by the recording/erase unit.

2. An apparatus according to claim 1, wherein the additional recording control unit searches for an area in the data non-recorded state with the predetermined length in response to the additional recording instruction, and records the target data from one end to the other end of the found area.

3. An apparatus according to claim 1, wherein the additional recording control unit searches for an area in the data non-recorded state with the predetermined

length, which is present on an innermost periphery side in a data recording area of the medium, in response to the additional recording instruction, and records the target data from one end to the other end of the found area.

4. An apparatus according to claim 1, wherein the additional recording control unit searches for an area in the data non-recorded state with the predetermined length, which is present on an innermost periphery side in a data recording area of the medium, by skipping in increments of predetermined length from a start point on the innermost periphery side of the data recording area of the medium in response to the additional recording instruction, and records the target data from one end to the other end of the found area.

5. A data recording method for additionally recording target data on a DVD-RW medium in response to an additional recording instruction, comprising:

recording target data by irradiating the medium with light beams with different intensities to change a phase change recording layer of the medium to a first data recorded state and second data recorded state; and

changing the phase change recording layer to a data non-recorded state by irradiating the medium with a light beam of a predetermined intensity from a recording terminal end of the target data over a predetermined length.

6. A method according to claim 5, wherein an area in the data non-recorded state with the predetermined length is searched for in response to the additional recording instruction, and the target data is recorded from one end to the other end of the found area.

7. A method according to claim 5, wherein an area in the data non-recorded state with the predetermined length, which is present on an innermost periphery side in a data recording area of the medium, is searched for in response to the additional recording instruction, and the target data is recorded from one end to the other end of the found area.

8. A method according to claim 5, wherein an area in the data non-recorded state with the predetermined length, which is present on an innermost periphery side in a data recording area of the medium, is searched for by skipping in increments of predetermined length from a start point on the innermost periphery side of the data recording area of the medium in response to the additional recording instruction, and the target data is recorded from one end to the other end of the found area.

9. A DVD-RW medium comprising a phase change recording layer,

wherein the phase change recording layer is changed to a first data recorded state, second data recorded state, and data non-recorded state upon being

irradiated with light beams with different intensities, and

the phase change recording layer records target data when the phase change recording layer is changed to the first and second data recorded states, and the phase change recording layer is changed to the data non-recorded state over a predetermined length from a recording terminal end of the target data, upon being irradiated with the light beams with different intensities corresponding to additional recording control of the target data.

10. A medium according to claim 9, wherein the target data is recorded from one end to the other end of an area in the data non-recorded state with the predetermined length, which is found by a search from the phase change recording layer, in correspondence with additional recording control of the target data.

11. A medium according to claim 9, wherein the target data is recorded from one end to the other end of an area in the data non-recorded state with the predetermined length, which is found by a search from the phase change recording layer and is present on an innermost periphery side, in correspondence with additional recording control of the target data.

12. A medium according to claim 9, wherein the target data is recorded from one end to the other end of an area in the data non-recorded state with the

predetermined length, which is found by a search by skipping in increments of predetermined length from a start point on an innermost periphery side of the phase change recording layer and is present on the innermost periphery side, in correspondence with additional recording control of the target data.